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# Emotional Eating is Associated with Intake of Energy-dense Foods in Latinos

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# Emotional Eating is associated with intake of energy-dense foods in Latinos

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## Abstract

**Background**: Latinos experience profound health disparities in diet-related chronic conditions. Emotional eating (EE) has been positively associated with such conditions, however, little is known about the relationship between EE and energy-dense food intake that may influence risk for developing these conditions. Objective: To examine associations between EE and energy-dense food intake in Latino men and women. **Methods**: Latino individuals were recruited from a community health center in Lawrence, MA. Participants completed standardized assessments. EE was measured with the Three Factor Eating Behavior Questionnaire R18-V2. Dietary intake was measured with a culturally tailored Food Frequency Questionnaire. Energy-dense food groups defined as food groups exceeding 225calories per 100 grams were identified. Covariates considered in this analysis included: age, sex, education, employment status and BMI. Statistical analysis consisted of multivariable logistic regression. **Results**: A total of 201 participants were included in this analysis (53.7% female, 68.1% Dominicans). After adjusting for covariates, EE was significantly associated with high intake of sweet and fatty foods, namely dairy desserts (i.e., ice-cream, sherbet and frozen yogurt) (OR=1.55; 95%CI=1.08, 2.21; p=0.017), oleaginous fruits (i.e., nuts and seeds) (OR=1.44; 95%CI=1.01, 2.05; p=0.046) and baked goods (i.e., cakes, cookies, pies, doughnuts and muffins) (OR=1.54; 95%CI=1.07, 2.20; p=0.020). **Conclusion**: EE was positively associated with consumption of energy-dense foods in this Latino sample. Future studies should examine longitudinal associations between EE, intake of energy-dense foods and risk of chronic health conditions. Understanding these associations can unveil potential intervention targets for Latinos at high risk of diet-related chronic health conditions.

## Background

- Latinos are amongst the largest and fastest-growing ethnic minority in the U.S., constituting a fifth of the U.S. population (1).
- Latinos experience health disparities in nutrition related CVD risk factors with 80% of men and 71% of women having at least one CVD risk factor (2).
- Emotional eating (EE), overeating due to an inability to resist emotional cues (3), has been positively associated with CVD risk factors (4,5).
- EE has been associated with greater intake of sugar-sweets, high fat sweets, and high fat salty foods in young, European and female samples (6-13).
- Little is known about associations between EE and dietary patterns among Latino adults.
- Given the prevalence of diet-related CVD risk factors in this population (2), associations between EE and intake of energy-dense foods are of particular interest.
- A positive association between EE and energy intake could provide insights for future targets for prevention and management of obesity and associated CVD risk factors.

## Objective

- To examine associations between EE and energy-dense food intake in a sample of Latinos adults in the northeast U.S.

## Methods

- Cross-sectional analysis; Latino Health and Well-Being Study

*Subjects*

- Participants recruited from the Greater Lawrence Family Health Center (Lawrence, MA).

*Inclusion and Exclusion Criteria*

- Inclusion Criteria: Latino, ages of 21-84 years, and Spanish or English speaking.
- Exclusion Criteria: plans to move out of the area within the study period and cognitive impairments. The present study excluded participants that did not completed the Multicultural Food Frequency Questionnaire (FFQ) and had missing data on exposure/covariates.

*Procedure*

- Participants completed standardized interviews that included socio-demographics, eating behaviors and anthropometric measures. After completion of baseline assessments, a subsample of participants completed dietary assessments with an FFQ.

*Measures*

- Emotional Eating (EE): Three Factor Eating Questionnaire (TFEQ) R18-V2 (14). Subscale of 6 items. Response options included: definitely false (1), mostly false (2), mostly true (3) and definitely true (4). Items were summed and the mean of items was calculated. Score range from 1-4.

## Methods (continued)

- Energy-dense Foods: a 193-item FFQ culturally adapted for Latinos was used to assess dietary intake (15). Energy-dense food groups were defined as food groups exceeding 225 calories per 100 grams. A total of 11 energy-dense groups were identified (shown in Figure 1 and Table 3). Percentage of calories from each food group were calculated. Medians were computed for each food group and each food group was categorized as low and high according to the group specific medians.
- Covariates: self-reported age, sex, education, employment status and Body Mass Index (BMI; kg/m$^2$).

*Statistical Analysis*

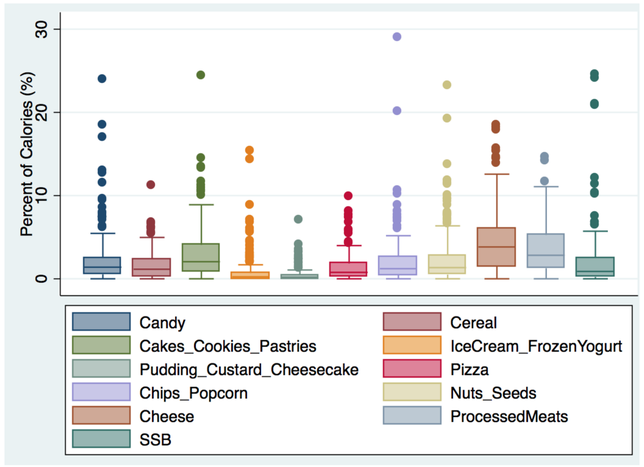
- Descriptive statistics include median (P25, P75) for continuous variables and frequencies for categorical variables
- Logistic regressions adjusted for age, sex, education, employment status and BMI were performed to study the association between EE and odds of high intake of each specific energy dense food group.
- STATA version 14 was used for all analyses. Significance was set at p<0.05.

## Results

**Table 1. Demographic characteristics of the Latino Health and Well-Being Study (N=201)**

| Characteristics | Total Sample N=201 (%) |
|---|---|
| **Female** | 108 (53.7) |
| **Age** (in years) | |
| 21-34 | 66 (32.8) |
| 35-54 | 76 (37.8) |
| 55-84 | 59 (29.4) |
| **Ethnicity** | |
| Puerto Rican | 43 (21.4) |
| Dominican | 137 (68.1) |
| Other | 21 (10.5) |
| **Education** | |
| <High School | 100 (49.8) |
| High School | 36 (17.9) |
| Some college | 65 (32.3) |
| **Employed** | 119 (59.5) |
| **BMI**; median (P25-P75) | 28.5(25.4, 32.4) |
| **Emotional Eating**; median (P25-P75) | 1.5(1, 2.17) |

**Figure 1. Distribution of intake of energy dense food groups in the Latino Health and Well-being study (n=201)**




## Results (continued)

**Table 3. Association between Emotional Eating and intake of energy dense food groups in the Latino Health and Well-being study (n=201) .**

| Food Group | OR (95%C.I.) | P value |
|---|---|---|
| Candy | 1.13(0.81, 1.60) | 0.465 |
| Cakes, cookies and pastries | 1.54(1.07,2.20) | **0.020*** |
| Pudding, custard and cheesecake | 1.17(0.82, 1.67) | 0.379 |
| Chips and popcorn | 1.18(0.84,1.66) | 0.347 |
| Cheese | 1.09(0.78,1.54) | 0.605 |
| Sugar sweetened beverages | 0.90(0.64,1.28) | 0.564 |
| Cereal | 0.97(0.68, 1.38) | 0.866 |
| Ice-cream and frozen yogurt | 1.55(1.08, 2.21) | **0.017*** |
| Pizza | 1.35(0.93, 1.95) | 0.115 |
| Nuts and seeds | 1.44(1.01,2.05) | **0.046*** |
| Processed meat | 0.71(0.49,1.02) | 0.067 |

Models adjusted for age, sex, education, employment and BMI. Odds of having intake above the median was modeled.
***Statistically significant, p<0.05**

## Discussion and Conclusion

- EE was associated with intake of selected energy dense food groups in this sample of U.S. Latino men and women.
- Our finding of an association between emotional eating and high fat sweets was consistent with at least 8 previous studies conducted with other populations (i.e., European, females or adolescent populations). In particular:
  - Five observational studies documented positive associations between EE and intake of high fat sweets (6-10).
  - Three experimental studies found that individuals with high EE consumed more high fat sweets after experiencing a stressful event (11-13).
- High fat sweets are considered palatable foods, that is, foods that produce a greater hedonic response and and stimulate greater intake (16). Research has shown that intake of palatable foods may reduce negative emotions and may blunt the stress response among emotional eaters (17). In addition, research suggests that sugar acts as an enhancer of palatability of high fat foods, increasing the hedonic response for emotional eaters (18).
- However, our study did not find statistical significance between emotional eating and the pudding, custard and cheesecake group. This may be due, in part, to the low variability of intake of this food group in our sample. In fact, this was the group with the lowest range of values in the sample. Other food groups evaluated in this study, still considered as palatable, were not significantly associated with emotional eating. It is possible that we did not find an association because these groups were not both high in sugar and fat.
- Future studies should examine longitudinal associations between EE and intake of high fat sweets, and in turn these associations with health conditions such as CVD risk factors.
- Understanding these associations can unveil potential intervention targets for Latinos at high risk of diet-related chronic health conditions.

## References

1) D'Vera C. Future immigration will change the face of America by 2065. Pew Research Center. http://www.pewresearch.org/fact-tank/2015/10/05/future-immigration-will-change-the-face-of-america-by-2065/. Published 2015. Accessed 02/15/17.
2) Davoglus M, Talavera G, Avilés-Santa M, et al. Prevalence of major cardiovascular risk factors and cardiovascular diseases among Hispanic/Latino individuals of diverse backgrounds in the United States. *JAMA*. 2012;398(17):1775-1784
3) Karlsson J, Persson L, Sjostrom L, et al. Psychometric properties and factor structure of the Three-Factor Eating Questionnaire (TFEQ) in obese men and women. Results from the Swedish Obese Subjects (SOS)Study. *Int J Obes Relat Metab Disord*. 2000;24(12):1715-1725
4) Loffler A, Luck T, Then F. Eating behavior in the general population: an analysis of the factor structure of the German version of the Three Factor Eating Questionnaire and its association with body mass index. *2015*. 10(7):e0133977
5) Stefanov T, Vekova A, Kurktschiev D, et al. Relationship of physical activity and eating behavior with obesity and type 2 diabetes mellitus: Sofia Lifestyle (SLS) Study. *Folia Med (Plovdiv)*. 2001;53(1):11-18
6) de Lauzon B, Romon M, Deschamps V. The Three-Factor Eating Questionnaire-R18 is able to distinguish among different eating patterns in a general population. *J Nutr*. 2004;134(9):2372-2380.
7) Camilleri G, Mejean C, Kesse-Guyot E, et al. The associations between emotional eating and consumption of energy-dense snack foods are modified by sex and depressive symptomatology. *J Nutr*. 2014;144(8):1264-1273
8) Nguyen-Michel ST, Unger JB, Spruijt-Metz D. Dietary correlates of emotional eating in adolescence. Appetite. 2007;49(2):494-499.
9) Keskitalo K, Tuorila H, Spector D, et al. The Three-Factor Eating Questionnaire, body mass index, and responses to sweet and salty fatty foods: a twin study of genetic and environmental associations. Am J Clin Nutr. 2008;88(2): 263-271.
10) Konttinen H, Mannisto S, Sarlio-Lahteenkorva S, et al. Emotional eating, depressive symptoms and self-reported food consumption. A population-based study. Appetite. 2010;54(3):473-479.
11)Oliver G, Wardle J, Gibson L. Stress and food choice: a laboratory study. Psychosomatic Medicine. 2000;62:853-865.
12) Grunberg NE, Straub RO. The role of gender and taste class I the effects of stress on eating. Health Psychol. 1992;11(2):97-100.
13)van Strien T, Cebolla A, Etchemendy E, et al. Emotional eating and food intake after sadness and joy. Appetite 2013;66:20-25.
14) Cappelleri J, Bushmakin A, Gerber R. Psychometric analysis of the Three-Factor Eating Questionnaire-R21: results from a large diverse sample of obese and non-obese participants. *Int J Obes*. 2009;33(6):611-620.
15) Palacios C, Trak M, Betancourt J, et al. Validation and reproducibility of a semi-quantitative FFQ as a measure of dietary intake in adults from Puerto Rico. Public Heal Nutr. 2015;1–9
16)Ramirez I. What do we mean when we say "palatable food"? Appetite. 1990;14(3):159-161.
17) van Strien T, Roefofs K, de Weerth C. Cortisol reactivity and distress-induced emotional eating. Psychoneuroendocrinology. 2013;38:677–84
18) Emmett PM, Heaton KW. Is extrinsic sugar a vehicle for dietary fat? Lancet 1995;345:1537-40

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